

1 **ABSTRACT OF THE DISCLOSURE**

2 Methods and apparatuses for bonding solder balls to bond pads
3 are described. In one embodiment, portions of a plurality of solder
4 balls are placed within a frame and in registered alignment with
5 individual bond pads over a substrate. While the ball portions are
6 within the frame, the balls are exposed to bonding conditions effective
7 to bond the balls with their associated bond pads. In another
8 embodiment, a frame is provided having a plurality of holes sized to
9 receive individual solder balls. Individual balls are delivered into the
10 holes from over the frame. The balls are placed into registered
11 alignment with a plurality of individual bond pads over a substrate while
12 the balls are in the holes. The balls are bonded with the individual
13 associated bond pads. In another embodiment, a frame is provided
14 having a hole. A solder ball is provided having an outer surface. The
15 solder ball is retained within the hole in an ambient processing
16 environment which is generally uniform over the entirety of the ball's
17 outer surface. While the solder ball is within the hole, the solder ball
18 is bonded with an associated bond pad on a substrate.

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